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SAMIA COLUMBIA.

For the beautiful colored figure of the larva of this remarkable insect we are indebted to the kindness of Mr. G. J. Bowles, of Montreal, who made the drawing and prepared the stones from which it was printed. The printing is the work of the Burland Desbarats Lithographic Co., of Montreal, and is in every way creditable to that enterprising company.

It is not a little remarkable that two descriptions of the larva of this rare insect should have reached us at the same time, and since they record observations independently made, and the subject is so interesting, we have thought it best to print them both in full, even at the risk of a little repetition.

NOTES ON THE LARVA OF SAMIA COLUMBIA SMITH.

BY F. B. CAULFIELD, MONTREAL, P. Q.

(Read Before the Montreal Branch of the Ent. Society of Ontario, Aug. 7, 1877.)

Form same as *S. cecropia*; number and position of tubercles also the same. General color green; bright yellowish green on dorsal surface; pea green on head, sides and under surface. Length when at rest exactly two and a quarter inches; when in motion almost two and three-quarter inches.

Head pea green, mouth parts pinkish grey, mandibles black.

Dorsal surface—First segment with four small flattened transversely oval warts, consisting of a black ring with a white centre; 2nd, 3rd and 4th segments each with two large bulbous tubercles, cream color, at base; above this there is a raised or swollen ring of black; remainder coral red, with seven upright spines on top; 5th, 6th, 7th, 8th, 9th and 10th segments each with two simple tubercles, basal half white, remainder brigh

yellow ; the tubercles on 5th segment are tipped with three upright black spines, the others with only one each ; 11th segment with one large central tubercle, the extreme base of which is white, remainder yellow with an irregular circlet of small black warts about the middle, tipped above with three small blunt black spines ; 12th segment with four short white tubercles, anterior pair largest, tipped with four short black spines, posterior pair with a single black spine.

Lateral tubercles white, the upper row with a brown ring at base, the lower with a black ring at base ; 2nd and 3rd lateral tubercles tipped with seven black spines, 4th with five, remainder with one each. Spiracles white, surrounded with a narrow black ring. Feet green, claws black, prolegs green, claspers mauve.

I received the larva from which the above description was taken by mail, on August 1st, 1877, from J. C. Stockwell, Esq., of Danville, P. Q. Unfortunately no details were given of its capture or food plant. In the box in which it was sent were some black currant leaves ; as these were withered, I obtained a fresh supply from the garden of a friend ; it fed on these, but did not appear to be quite satisfied with them. I then tried it with apple, maple, elm and various other leaves, but it would touch nothing but the currant, and of that it ate less and less, finally, to my very great disappointment, pining away until it died. It occurred to me afterwards that it might have been found on the wild currant, as the leaves sent with it seemed to be finer than those of the cultivated species.

Although the form of this larva and the position of the tubercles is similar to that of *cecropia*, the difference in coloration will at once distinguish them, the ground color being much lighter in *columbia*, and the green inclining as much to yellow in that species as it does to blue in *cecropia*. The tints of the larva of *columbia* are more decided, not having the watery appearance noticeable in *cecropia*, the yellow being brighter and the red more intense ; but the great points of distinction are the additional red tubercles (as noticed by Mr. Bowles in 1864, see CAN. ENT., vol. 3, p. 201), and the absence of blue, the tubercles that are blue in *cecropia* being white in *columbia*. That this larva is generically the same as *cecropia* is undoubted, the only distinctions being those of size or coloring. The absence of blue in the larva of *columbia* seems to be against the supposition that it is produced by the union of *cecropia* with *promethea*, the larvæ of both these species being conspicuously marked with that color.

ON THE EARLY STAGES OF *SAMIA COLUMBIA* SMITH.

BY C. H. FERNALD, ORONO, MAINE.

On the night of the 7th of last June my wife captured at light a fine female *Samia columbia*. The moth was at once secured, her wings pinioned, and she was placed in a cage with the hope that specimens of the other sex might be attracted, but none made their appearance; and on the night of the 12th she laid five eggs, glueing them to the gauze on the side of the cage, two in one place and three in another. During the following day (13th) none were laid, but on the night of the 13th she laid fourteen more in several different clusters, and on the night of the 14th she laid six more. None were laid during the following day and night, and as she was injuring herself with the pinion, she was killed and spread. Whether she would have laid any more had she been kept longer, or whether she had laid any before her capture, I cannot say.

On the morning of the 26th one of the eggs hatched. I then began to look about for their food plant. Smith states, Proc. Boston Society of Natural History, vol. ix., p. 344, as follows: "They [the cocoons] were mostly attached to *Nemopanthes canadensis* and *Rhodora canadensis*; a few were found upon *Kalmia angustifolia* and maple, and one upon the larch. The larvæ undoubtedly feed upon the first two plants, and perhaps upon the others; but the cocoons were always where the larvæ might have fed upon the *Nemopanthes* or *Rhodora*."

Dr. Packard, in his Synopsis of the Bombycidae, Proc. Ent. Soc. Phil., vol. iii., p. 380, says: "It (*S. columbia*) feeds upon *Rhodora canadensis*, spinning its large cocoons upon the terminal twigs of that shrub."

Guided by these statements, and remembering that *Nemopanthes canadensis* does not occur in this region to my knowledge, I first collected *Rhodora canadensis*, and gave them, but they never so much as tasted it, though I kept a few on it till they were nearly starved. I cut the edge of the leaf so they might have easy access to the soft juicy parts of the interior, but all to no purpose. I tried them on *Kalmia angustifolia*, *Amelanchier canadensis*, maple, beech, white birch, ash, apple, pear, willow, ilex, gooseberry, currant and larch. They just tasted of the last four, but would not feed upon them. I should say that the trial on larch was not

satisfactory, as I put but one on it and kept it there less than half an hour. Finally I put them on elm, upon which they fed a little, but died one after another.

My friend, Mr. Charles Fish, had been fortunate enough to secure a female which laid twenty-five eggs, I think, and with the young hatched from these he was having a similar experience to my own. He finally succeeded in getting the remaining few of his to eat wild red-cherry (*Prunus pennsylvanicus*). I was obliged to leave home at this time, and got my friend, Mr. Anson Allen, to take the care of my young *columbias* in my absence. Learning of Mr. Fish's success with wild cherry, he put a part of the remaining number on that plant, leaving a few on elm, all of which died, while those fed on the wild cherry succeeded in passing the first moult, and I have been able to carry three through and see them spin up their cocoons successfully. About the time these were in their later moults Mr. Allen found two *columbia* larvæ feeding on larch (*Larix americana*), so remote from other trees that there could be no possibility of their having crawled on to it from any other tree, and further, these same larvæ continued feeding on the larch in confinement for several days, and then spun their cocoons. Mr. Fish also found one or two larvæ feeding on the larch, several miles from where Mr. Allen's were found. These were all in a very healthy condition, and, it is hoped, will yield good imagines next year.

I have observed this striking peculiarity in the habits of the larva of *columbia*, that from the time they hatch till they are done feeding they never wander about, but remain upon a leaf or twig entirely unsuitable for food till they starve, even though there be fresh food within half an inch of them.

When they are fully grown and are done feeding, they evacuate their bodies and then begin to travel around their enclosure, continuing their travels sometimes for twenty-four hours, till they find a suitable place in which to spin their cocoons. At first they spin a certain amount of white or silver-colored silk, and after that has been expended, the brown silk. One of the larvæ wandered about for a long time before it appeared to get ready, or to find a suitable place in which to spin its cocoon, and all this time it was wasting its silvery silk, spinning it freely as it crawled slowly over the surface of the glass forming one side of the breeding cage. At last a satisfactory place was found, and the cocoon spun, but almost entirely without the characteristic silvery bunches upon

the outside, for the simple reason, as it would seem, that the larva had no white silk remaining to give the appearance usually seen upon the outside. I further observed that those which spun up immediately, without wandering about much, make cocoons with the most complete silvery bunches upon them. After the first long threads of the cocoons have been extended, the larva moves its mouth back and forth for a considerable length of time in one place, as far as it can move its head, thus depositing a large amount of the silvery silk in this place; then moving to another place, the same operation is performed, and so on over the whole *exposed* parts of the cocoon. I did not see that they deposited any of the silk in this way against the under surface of the glass when the cocoon was placed against it. Nearly all of the cocoons which have been found here were on the larch, and these silvery bunches certainly give them a very close resemblance to the bark of that tree.

Egg.—Sub-globose, slightly compressed, the compression being least upon the side from which the young escapes; cream-colored, clouded with reddish-brown, and attached to the object upon which the female deposits by means of a dark brown adhesive substance, which appears to be the same as that which is clouded over the surface of the egg, but the greater abundance of it at the point of attachment produces a much darker color. Greatest diameter, 2 mil.; medium, $1\frac{1}{2}$ mil.; least diameter, $1\frac{1}{3}$ mil. The eggs hatched in fourteen and fifteen days after they were deposited.

Young Larva.—Length immediately after escaping from the egg shell, 4 mil. Color black; some of the individuals show a greenish tinge around the base of the tubercles. Body cylindrical, slightly tapering towards the posterior extremity; head large, rounded, sparsely clothed with long hairs. The second (first after the head), third, fourth, fifth and sixth segments each with eight tubercles, the lowest one on each side much smaller than the others. The seventh, eighth, ninth, tenth and eleventh segments have each six tubercles, rather smaller than the corresponding ones on the preceding segments. The twelfth segment has five tubercles, two on each side corresponding with those on the preceding segment in size, and one on the middle of the dorsum of the same size as the upper ones on the third segment. The thirteenth segment has four tubercles on the anterior edge and one at the base of each anal proleg. The tubercles are smooth, cylindrical, gradually enlarging towards the base and at the summit, the least diameter being about two-thirds the way up; length equal to about three times the least diameter, surmounted with

from two (on the smallest) to six finely serrated, radiating bristles which are about twice the length of the tubercles. Duration of this stage eight to nine days.

After the First Moulting—Length (taken a short time before the second moult), 15 mil. Color pea green. Tubercles and bristles, mandibles, palpi and antennæ, a spot about the eyes, a stripe on each side of the clypeus, the legs and a spot on the outside of the prolegs, black. Second, third and fourth segments each with four black spots on the posterior edge and a row of black spots on each segment after the head, on the line of and behind the stigmata. Duration of this stage five to seven days.

After the Second Moulting—Length (taken soon after the second moult) 20 mil. Color pea green with a bluish tint upon the dorsum. Black markings as in preceding stage. Duration of this stage four to five days.

After the Third Moulting.—Length 35 mil. Color pea green, lighter on the dorsum. Marked with black as in the two preceding stages. All the tubercles with the basal portions blue, except those on the second segment and the lower one on each side of the third to the sixth segments inclusive. Duration of this stage six to nine days.

After the Fourth Moulting—Length 50 mil. The head at the time the larva escaped from the egg-shell was proportionally large, but during the succeeding stages it did not grow so fast as the other parts of the larva, and at the beginning of this stage, but more especially at its close, it was proportionally small. Duration of this stage ten to twelve days.

Mature Larva—Length 76 mil.—about three inches. Thickness between the segments 13 mil., of largest part of segment 15 mil.

Head pea green, sparsely clothed with fine yellowish hairs. Mandibles, outer joints of antennæ and palpi, spot about the eyes, two spots on the gular (these may have occurred in the previous stages, but were not observed), and a stripe on each side of the clypeus, black, the latter sometimes wanting. Basal joints of antennæ and palpi and the labrum greenish blue. General color of the body pea green, rather lighter than the head, and lighter above than on the sides, with the faintest tinge of blue between the segments. Last joint of the legs and claw black. Stigmata oval, white, surrounded by a fine black line.

The tubercles were greatly changed at the fourth moult, both in form and color. The first and lowest on the second segment is small, conical, black and surmounted by a few short, stout, black spines. The second is

more rounded at the top, shining black at the base, and resembling white glazed porcelain at the apex, with four black spines. The next two are smaller, about $2\frac{1}{2}$ mil. apart on the front edge of the segment, the lower of which is about 5 mil. from No. 2. These are very small and black, the upper one having a trace of greenish-white at the apex, and both are surmounted with several short black spines. The lowest tubercles on segments three to six inclusive are small with black bases, apices resembling white glazed porcelain, and generally two black spines. The tubercles of the next row above, extending from the third to the last segments inclusive, are very similar in form and color, but larger; those of the row above this are slightly pear-shaped, a very little thickened towards the outer end, of the same color as the preceding, and surmounted with from four to six short stout black spines. Those of the next row on the third, fourth and fifth segments, and the corresponding ones on the opposite side of the dorsum—by far the largest on the larva—are pear-shaped, largest outwardly, porcelain white at the base, with a band of shining black above, and a bright coral-red top, with from six to eight stout black spines. The tubercles of this row on the sixth to the eleventh segments inclusive are nearly as tall, but slimmer than those preceding, slightly curving backward, porcelain white at the base, a very light straw color above and armed with two black spines at the top. The dorsal tubercle of the twelfth segment is very similar, but larger, and armed with several black spines. The tubercle at the base of the anal proleg is smaller than those before it, of a light bluish color, with black at the base outside.

The most striking differences observed between *P. columbia* and *P. cecropia*, in a brood of the latter raised by the side of the former, are—first, the smaller size of *columbia* at each of the stages; the mature larva of *columbia* is about three inches in length, that of *cecropia* about four. Secondly, *columbia* is of a clear light pea green color, *cecropia* a dull bluish green, giving a much darker aspect to this larva. This distinction of color is so marked that if once observed, the one can never be mistaken for the other. Thirdly, *columbia* has three pairs of coral-red tubercles, one pair each on the third, fourth and fifth segments; *cecropia* has two pairs, one pair each on the third and fourth segments. Then the color of these differ; those of *columbia* are a true coral or vermilion-red, while all the *cecropias* I have seen have these tubercles a color somewhat approximating that of resin. The remaining dorsal pairs of tubercles to the twelfth segment, and the central one on the twelfth, are lemon yellow, while in

columbia they are white at base and a very light straw color above. The remaining tubercles of *cecropia* are black at the base and blue above; in *columbia* they are black at the base, but with the look of white glazed porcelain above. These distinctive characters showed no tendency to run into each other in any of the examples I have seen. As perhaps having a bearing upon the question whether *columbia* is a hybrid between *cecropia* and *promethea*, I will say that in six years of careful collecting at this place I have never taken a *promethea*, nor has one ever been taken here to my knowledge; yet the empty cocoons of *columbia* have occasionally been found, mostly in larch trees, in one instance about forty feet from the ground.

I am therefore convinced that *columbia* is a good species, but whether distinct from *Gloveri* I am not prepared to express an opinion.

In my observations on *columbia* I have been greatly assisted by Messrs. Allen and Fish, who rendered every possible aid and placed their notes at my entire disposal.

ON FOOD PLANTS OF PAPILIO CRESFONTES (THOAS).

BY THE EDITOR.

In September last we were much gratified, although somewhat surprised, at receiving a number of the larvæ of this beautiful butterfly from Mr. S. Eccles, of St. Thomas, Ontario, a town situated about 17 miles south of London, and about half way between it and Lake Erie. They were found in Mr. Eccles' garden, feeding on *Dictamnus fraxinella*, a perennial herb which is a native of Southern Europe, but cultivated in this country for ornament in gardens. The larvæ were in different stages of growth, from one to two inches in length, and were feeding greedily on the plant referred to. We had never seen this larva before, but its markings are so peculiar that we recognized it at once from recollection of the figure given in Boisduval & LeConte, pl. 13. As this description may not

be accessible to many of our readers, we append the following free translation of it :—

“ The caterpillar is of a very mixed color ; its under surface is brown as well as the feet. On the four first segments there is a white lateral and longitudinal band, beginning from the head. Between that band and that of the opposite side there is a large brown patch marked by large brownish-black spots, and behind this on the middle segments there is a large white patch in the shape of a lozenge, which covers the back and a part of the sides, one of the angles of which reaches the first pair of membranous feet. On the middle of that band there are some brown spots. The posterior part of the body is covered by another large white patch marked anteriorly with some brown spots ; the lateral part comprised between the lozenge-shaped and the last white patch, is of a uniform dark brown color. It feeds on all the trees of the genus *Citrus*, and is in some parts of America a sort of plague to the cultivators of the orange.”

For a few days, while fresh food of *Dictamnus* was at hand, the larvæ did well and grew rapidly, but the supply failing, they were transferred to a young orange tree, which was enclosed in a gauze bag to prevent their escape, when they lost their vigor and activity, and although they ate more or less of the foliage every day, they lost flesh and one after-another died, until only three or four remained. These lingered for a long time and two of them spun up and went into chrysalis, but the chrysalids were small and one of them deformed, and finally the remainder all died. Subsequently the chrysalids became stiff and hard, and on opening them they were found dead and dry.

Cresphontes has been taken on the wing at Chatham, 60 miles west of London ; also at the western extremity of the Province, at Amherstburgh. A dead specimen has also been found washed up on the shore of Lake Ontario, near Grimsby, but this is the first instance, as far as we know, of the larva having been found in Ontario.

Dictamnus belongs to *Rutaceæ* or the Rue family, under which there are also grouped in Gray's School and Field Botany the following genera and species : *Ruta*, Rue, sp. *Ruta graveolens*, common rue, exotic, but much cultivated in gardens ; *Zanthoxylum*, prickly ash, sp. *Z. americanum*, northern prickly ash, and *Z. carolinianum*, southern prickly ash, both indigenous ; *Ptelea*, hop-tree, sp. *Ptelea trifoliata*, indigenous ; *Skimmia*, sp. *S. japonica*, exotic from Japan, and *Citrus*, which includes both the

sweet and bitter orange, the lemon, lime and citron. In the south the larva feeds on the various trees belonging to this latter family. In the west it is said to feed on the prickly ash, and Prof. Snow says that in Kansas it feeds on the hop tree. Having now been found on *Dictamnus*, it becomes highly probable that the larva will also feed on *Rue* and *Skimmia*.

TINEINA.

BY V. T. CHAMBERS, COVINGTON, KY.

GELECHIA.

G. thoracefasciella Cham.

Sometimes the thorax is ochreous with a transverse brown band between the wings, instead of brown with an ochrey band, and the wings are blotched irregularly with ochreous. The proportion of the two colors varies.

G. ochrestrigella Cham.

In one specimen sent to me by Mr. Behrens the entire space from the end of the cell to the apex, between two of the discal branch veins, is brown.

G. obliquistrigella Cham.

Varies a good deal, without, however, altering the pattern of ornamentation. In a specimen now before me there is a distinct black dash near the apex in one wing, which is represented on the other wing by two minute dots. The base of the wing and the costal margin near it are nearly always brownish, and the other markings of the wings vary in their distinctness.

G. pravinominella.

I suggest this name for the species described by me under the name of *G. 4-maculella*, from Colorado, in the *Cin. Quar. Four. Sci.*, v. 2, p.

290. The species was named and described by me while in Colorado—away from libraries and collections—and the previous use of *q-maculella* was forgotten.

G. solaniella, ante v. 5, p. 176, and v. 4, p. 193.

The former accounts of this species are so meagre that I annex the following description :

Palpi simple; second joint more than half as long as the first.

Palpi grayish brown externally, more yellowish internally ; entire insect otherwise grayish brown and ochreous intermixed, microscopically dusted with white ; the ochreous and brown on the primaries take more or less the form of narrow longitudinal streaks, and the relative proportions of each color vary in different specimens, some being distinctly ochreous and others nearly brown. *Al. ex.* $\frac{7}{8}$ to half an inch. Kentucky.

Two specimens which I have received from St. Louis, from Miss Murtfeldt, are paler and more gray, with a distinct blackish dot on the fold about midway of the wing, and another small one between it and the costal margin which I have not detected in any of my specimens. These two specimens are also smaller than my own, but that they are of the same species is shown not only by their resemblance in other respects, but by the habits and appearance of the larvæ. The following account of the larvæ is furnished to me by Miss Murtfeldt, and agrees with my own observations, except that so far as I have observed, the entire larva turns blue when it is mature, while Miss Murtfeldt remarks it only of the first three segments. I have published a very brief account of the mine and larva, ante v. 5, p. 193, and the following is Miss Murtfeldt's account :

"The larva mines and crumples the leaves of *Solanum Carolinense*, turning them brown. Inside of the mine the larva inhabits a tough, silk-lined gallery, formed externally of frass. This gallery extends around the edge of the leaf until the latter appears as if a gathering string had been run between the tissues. The larva is nearly cylindrical, about 0.40 inch. in length, of a translucent green color, with transparent piliferous spots arranged in the usual transverse rows on the thoracic segments, and in the form of a trapezoid on the abdominal segments. Head and cervical shield bright brown, polished and edged anteriorly with whitish green. The thoracic segments turn blue when the larva is mature. Legs and prolegs short, yellowish green. The larva leaves the mine and pupates

on the surface of the earth in a slight cocoon, and the imago appears in about ten days, except the last fall brood, which hibernates in the chrysalis."

I have, as stated in a former number of the CAN. ENT., also received specimens of it from Texas. And *G. ciliolineaella* only differs by the white lines at and in the ciliæ.

G. Hermannella.

In vol. 4 I have copied from the *Nat. Hist. Tin.* a description of this species; and in *The Ento. Mo. Mag.*, v. 11, p. 279, I have given an account of a variety found in Kentucky and Missouri, and probably further south, which I copy here for the benefit of American readers and for the purpose of adding some additional particulars. The specimens of the variety which I have bred—something over twenty—were from larvæ taken at various localities in Kentucky, and all that I have captured in Kentucky belong to the variety likewise, and Miss Murtfeldt writes to me from St. Louis that the variety only has been bred there. If the old, well-known form occurs at all in this latitude, it must be very scarce.

"So far as I can learn, no variety of this species has yet been found in Europe, though the species occurs from Lapland to Naples. Some three years ago I found the larvæ mining leaves of *Chenopodium* on the shore of Lake Michigan, lat. 43 deg. N.; and from them I bred several specimens differing in no essential particular from the figure in *Nat. Hist. Tin.*, v. ix., plate 8. Afterwards I often found them mining the same leaves in Northern Kentucky, lat. 38 deg. (nearly), but as I had as many specimens as I then wanted, and never thought of a variety, I did not attempt to breed them until the summer of 1874. The larva was the same, the mine was the same, and the mined leaves were of the same plant that I had found in Wisconsin, but, to my surprise, all the specimens that I have bred differ so decidedly from the ordinary *G. Hermannella* that probably any Entomologist would have considered them, if only captured, as of distinct species. Yet a little ingenuity on comparison of the specimens will show how the one pattern of ornamentation is readily resolvable into the other. One who knows this 'micro,' or the figure of it before mentioned, will remember the silvery fascia dark-margined on both sides, the small silvery spot before the fascia beneath the fold, and the larger one just above the fold behind the fascia. Now, suppose the dark margins of the fascia increased in quantity, especially the posterior dark margin

then suppose all the dark margin *behind* the fascia gathered on the costal margin, forming a velvety black spot so large that it touches the small silvery spot above the fold behind the fascia ; in like manner, suppose the anterior dark margin of the fascia gathered together in a velvety black spot *before* the fascia beneath the fold ; then suppose the fascia widely interrupted in the middle—and you have the variety. The costal part of the fascia thus becomes the anterior silvery margin of a large velvety-looking black costal spot, which, by its confluence with the silvery spot above the fold, appears to be margined with silvery at that point, and sometimes has a few silvery scales scattered through it ; and the dorsal portion of the fascia becomes the hinder silvery margin of a large velvety-looking black dorsal spot, which, by its confluence with the silvery spot beneath the fold, appears to be margined with silvery at that place, and sometimes contains a few scattered silvery scales. Except that the quantity of black and silvery scales is increased somewhat, the insect does not differ from the old form."

But, as I find by specimens bred and captured since the above was written, I have only described above the specimens which most nearly approach the old form, and the variety is by no means a constant one. As the fascia in the old form is a little oblique, so the anterior margin of the costal spot is nearer to the base of the wing than the hinder margin of the dorsal spot ; sometimes both spots are silvery margined entirely both before and behind, and sometimes also within ; and in one bred specimen there is no dorsal spot at all, but the dorsal margin from the base to the ciliae is silvery. There are some other more minute differences which it might be necessary to mention if one were describing a new species ; and perhaps where the word "silvery" occurs above it would be more accurate to write violaceous-silvery.

HAMADRYAS (Clem.)

H. Bassettella Clem.

The only variation that I have observed in this species is in the ground color, which ranges from sulphur to almost brick-red. It is abundant in all the Texas collections, and though originally described from Connecticut, I have never met with it in Kentucky or in Colorado.

PHÆTUSA.

P. plutella Cham.

The statement in the description of this species that the white streak

before the ciliæ is absent is incorrect. It should read that it is present.

EPICORTHYLIS Zell.

I copy the brief generic diagnosis from *Bei. Z. Kent.*, 1873, p. 48:

Capitum depressum elongatum. Ocelli nulli. Antennæ crenulate. Palpi libiales porrecti, thorace multi longiores, articulo secundo sub-arcuato subtus lævis supra posticæ squamis erectis crestato; terminali setaceo, erecto. Haustellum brevissimum. Alæ anteriores angustæ, marginibus oppositis sub-parallelis; cellula media simplici, vena apicali furcata; posteriores anterioribus latiores, trapeziformes, margine postico infra apicem levitè impresso, vena mediana trifida. Tibiæ posticæ in dorso piloso-crestatæ.

E. inversella Zell.

Until I saw the species I supposed that it might be congeneric with *Sagaritis gracilella* Cham. It, however, seems to resemble it chiefly in having the tuft on the upper side of the second joint of the palpi. It is a heavier-bodied, clumsier-looking insect than *S. gracilella*. Prof. Zeller's specimens were probably a little worn, as he describes and figures the fore wings as having the spots arranged 1, 2, 1, as some of mine have them; but these are a little worn. The best specimens have large spots, or perhaps I might call them short transverse bands, arranged 1, 1, 1.

The species is dark gray, the scales tipped with hoary. The palpal tuft is whitish on its internal surface. Antennæ annulate with dark gray. The dorsal half of the fore wings is paler than the costal, and the disc is whitish or almost hoary, and behind this whitish part of the wing and not distinctly separated from it, is a whitish fascia concave towards the apex. The spots above mentioned are in the whitish discal part of the wing. *Al. ex.* about $\frac{1}{2}$ inch. It is as yet known only from Texas.

DESCRIPTION OF A NEW GRAPHOLITHA.

BY A. R. GROTE, BUFFALO, N. Y.

Grapholitha taleana, n. s.

♂. Fore wings brownish fuscous; under the glass the scales are seen to be blackish with white tips. Thorax concolorous. Fore wings with

three orange-ochre costal lines; the outer two ante-apical, outwardly oblique and joining a marginal line of the same color; the inner a little less oblique, just without the middle of the wing. The marginal line only extends to the outer border of a black patch situate below the median fold and containing four or five ochre dots. Fringes silky, concolorous with the wings. Hind wings a little darker than primaries, immaculate. Beneath concolorous brownish fuscous, with the exterior margins of both wings shaded with pale. Costa of primaries above at apices narrowly yellowish, enclosing fuscous streaklets. No costal fold.

Expanse 18 mil. Illinois, Mr. Thos. E. Bean, No. 630. Seems to be rather distantly allied to the European *arcuana*.

NEW NOCTUAE.

BY LEON F. HARVEY, M. D., BUFFALO, N. Y.

Agrotis Hilliana, n. s.

♀. All the tibiae spinose. Allied to *perconfusa*, but much brighter colored and with larger and distinctly annulated stigmata. Bright rusty ochre, shaded with lilac gray. A fine black basal streak reaches to the small black marginal claviform. Base of the wing ochreous, basal half line double, the inner line distinct blackish brown. Sub-basal space washed with lilac gray. Inner transverse line a little oblique, nearly straight with a slight outward curve below submedian vein on the margin, double, the outer line distinct, the inner fades out below costa. Median space rusty ochre; orbicular large, ochreous, with faint internal annulus, oblique, ringed with black; reniform similar in color, upright, very near the exterior line, which commences on the costa just above it. Exterior line lunulate, nearly straight, faintly indicated below costa. Sub-terminal space dark, washed anteriorly with lilac gray, contrasting with clear ochreous terminal space and fringes. Hind wings pale ochreous with faint lunule and double shaded lines. Abdomen above pale ochreous. Thorax rusty and dark. Head and collar pale ochreous. Palpi brown at

the sides ; third joint pale. Beneath ochre-yellow, powdered with red with faint markings. Abdomen and thorax beneath rusty brown.

Expanse 36 m. m. *Hab.* Lewis Co., N. Y. Collected by Mr. W. W. Hill, of Albany, after whom I take pleasure in naming this handsome species.

Polia diffusilis, n. s.

♂. Size large. Eyes naked, lashed. Tibiæ unarmed ; thorax with a mesial crest ; abdomen untufted. Antennæ with the joints prominent, brush-like, bristled beneath. Concolorous, dark gray, at first sight recalling *Apatela americana*. Median lines blackish, dentate and denticulate, approaching a little toward internal margin. No basal dash. Orbicular concolorous, small, rounded, oblique, dark ringed. Reniform renal in shape, dark ringed, touched outwardly with whitish, moderate, not quite upright. Subterminal line very deeply dentate, dividing the more blackish or fuscous blackish terminal space from the remainder of the gray wing. The median space is perhaps a little darker than the subterminal and basal spaces. The subterminal space is narrow, widening to costa, where there are four costal dots ; between veins two and four it widens ; it is cut into large gray teeth by the line. A fine black terminal line. Fringes gray, interlined. Hind wings concolorous whitish gray, shaded with fuscous. Beneath whitish gray with common line, and discal dot on hind wings. Head and thorax dark gray ; abdomen fuscous gray.

Expanse 52 m. m. *Hab.* Lewis Co., N. Y., July. W. W. Hill.

Tricholita fistula, n. s.

♂ ♀. Antennæ of the male pectinate, eyes hairy. Superior wings olivaceous, not tinged with red. T. a. line faintly visible, irregular ; t. p. line evident, waved. Subterminal space broad, lighter in shade, glistening. Orbicular spot concolorous ; oval, black margined, uniform, pipe-shaped bowl turned to the base of the wing, white, broken ; outer portion of costal margin cut with white ; fringes concolorous. Inferior wings fuscous, beneath arcuated line and discal spot ; fringes lighter in shade. Thorax concolorous, abdomen fuscous ; a black line on upper portion.

Expanse 32 m. m. No. 40, J. Behrens. *Hab.* California.

This species is congeneric with *T. semiaperta* Morr. It is the first Californian representative of the genus.

Copablepharon, n. g.

The genus resembles *Arsilonche* in the lashless naked eyes, and *Om-*

matostola somewhat in ornamentation and habit, though not in color. It differs from either in the spinose tibiae. It is the only form of the *Heliophilid* genera which has this peculiarity. The single species, *C. absidum*, was formerly referred by me to *Ablepharon* (= *Arsilonche* teste Staudinger). It is from California; one specimen before me is from Webber Lake, July 22, collected by M. v. Osten Sacken. The thorax and fore wings are pale lemon yellow, with the veins somewhat paler and accompanied by dark powderings. Hind wings and abdomen white; the former slightly dusted with fuscous and with a more or less evident mesial line of dots on the veins.

Heliophila amygdalina, n. s.

♀. Allied to *ligata*, but the wings are more almond-shaped. Costa curved. Eyes hairy. Of the usual pale testaceous ochreous color, with a brighter shading on the cell. Costa broadly whitish rosy gray; veins obsoletely pale marked. The t. p. line is expressed by a continuous series of venular black dots, running more inwardly obliquely below vein 4 than in *ligata*. Hind wings white, very slightly soiled. Abdomen and thorax pale ochreous. Beneath the whitish hind wings show a terminal row of black points; the ochrey primaries a black mark at the ception of the exterior line on costa.

Expanse 34 m. m. Hab. Orono, Maine. Prof. Fernald, Coll. B. S. N. S.

Caradrina subaquila, n. s.

♂ ♀. Closely allied to *conviva*, but the thorax and fore wings are of a bright brown, somewhat purply. The terminal space pale, somewhat ochrey, and in one specimen broken into spots. The lines and spots as in *conviva*; the reniform resolved into two blackish points, more or less prominent and faintly pale ringed. Hind wings and fringes white; the former more or less soiled exteriorly.

Expanse 23 m. m. Hab. Bostrop Co., Texas. M. von Meske.

Caradrina clara, n. s.

♀. Fore wings and thorax blackish brown, paler shaded. Veins on primaries obsoletely powdered with white. Median lines sub-obsolete; the inner almost wanting; the outer geminate, shaped as in *grata*, and like as in that species, very near to the white marked narrow reniform.

Orbicular wanting. Fringes concolorous. Hind wings pale yellowish white, sub-pellucid. Beneath with distinct discal black spot visible above; a dark waved exterior line and indications on costa of a sub-terminal line; costal region shaded with fuscous. Fore wings dark with a waved perpendicular exterior line and a sub-obsolete sub-terminal line.

Expanse 26 m. m. *Hab.* Texas. M. von Meske, No. 2,611.

Graphiphora rubrica, n. s.

♀. Thorax yellowish fuscous or gray. Collar marked by a faint black line. Superior wings of a yellowish gray, suffused sometimes with a ruddy brown tinge; a black dash at base of fore wings. T. a. line geminate, waved; outer line black, more prominent on inferior border. T. p. line geminate, faintly black, commencing on costa above the reniform, boldly exerted and passing to the inferior border of wing directly in a line with the internal border of the reniform and terminating in a black dash. Sub-terminal commencing with a yellowish white apical patch and continuing as a clearly cut even yellow line to the inferior angle; orbicular spot oval, concolorous, light annulus, oblique; reniform concolorous with a black spot in the lower portion, light ringed, with inner margin most expressed. Costal margin with black and white markings; fringes concolorous with sub-terminal line; inferior portion of wings nearly concolorous with thorax. Inferior wings whitish, discal spot and arcuated line black; terminal line a series of black dashes; beneath same lines, only more marked.

Expanse 32 m. m. *Hab.* Rafael, Cal., April, No. 4, M. v. Osten Sacken.

The distinctive character of this species is the pale even sub-terminal line arising from a pale apical patch.

CORRESPONDENCE.

EGG-FEEDING MITES.

DEAR SIR,—

In the February number (p. 22) you quote Dr. Hagen as saying that "in the whole European literature I have not been able to find anything

about Acari eating eggs, so the fact seems new and is very important." The *Dermaleichus* figured in my 5th Mo. Rep. (p. 87) feeds upon the eggs of *Mytilaspis pomicorticis*, as well as upon the insect proper under the scale. In fact I find it more often feeding on the eggs. Dr. Packard long since observed and figured a mite (*Nothrus ovivorus*) that preys on the eggs of the Fall Canker-worm (*Anisopteryx pometaria* Harr.); while the beneficial effects of the Locust Mite (*Trombidium locustarum*) in destroying the eggs of the Rocky Mountain Locust have been frequently referred to of late years in my Reports, and recently in the February number of the *American Naturalist*.

C. V. RILEY.

St. Louis, Mo., March 8, 1878.

ARCTIA ANTHOLEA, Boisd.

DEAR SIR,—

Assuming that the figure of this species given in Stretch's Zygaenidæ and Bombycidæ, plate 3, fig. 8, is correct, and I have no doubt of it, then this species is identical with the European species, *Euprepia judica* Esp., and as this name has priority, *antholea* falls.

W. V. ANDREWS, Brooklyn, N. Y. *See p. 98*

CATOCALA MARMORATA.

DEAR SIR,—

Three good specimens of *Catocala marmorata* were collected by me at sugaring the latter part of August last, and also one fine specimen of *relicta*.

S. H. VAN WAGENEN.

Rye, Westchester Co., N. Y., Jan'y 29, 1878.

SAMIA COLUMBIA.

DEAR SIR,—

From cocoons of *columbia* kindly sent me by Mr. Anson Allen, of Orono, Maine, "found on larch trees many feet from the ground, where

they would be exposed to all the changes of winter weather," a single male escaped in the warm room where I kept the chrysalids. I found the specimen February 14th, but it had broken its wings, and I have no doubt it escaped one or two days previously. I had no immediate expectation of the chrysalids hatching, and hence did not examine the cocoons daily. I think it worthy of record that this species has the peculiar smell characteristic of *cecropia*.

A. R. GROTE, Buffalo, N. Y.

DEAR SIR,—

I would like to refer to a statement of a correspondent (in July No. of ENTOMOLOGIST) regarding the appearance in large numbers, in the vicinity of this city, of *Melitaea phaeton*. Although collecting nearly every day during the summer, I did not observe a single specimen of this butterfly, nor have I seen one collected by any one else. *M. tharos* is one of our most common butterflies; perhaps this was the one intended.

W. H. HARRINGTON, Ottawa, Ont.

DEAR SIR,—

In the summer of 1876, while examining the paper bands placed in our orchard to entrap the larvæ of the Codling Moth (*Carpocapsa pomonella* Linn.), I found quite a number of their larvæ and chrysalids apparently eaten by some *cannibal*, which, after close watch, proved to be *Tenebrioides laticollis* Horn. On several occasions I found them half way into a fresh chrysalis of *C. pomonella*.

This beetle, as well as *T. castanea* Mels., is very common here, and I will try to encourage this useful taste of theirs.

CHARLES D. ZIMMERMAN, Buffalo, N. Y.

DEAR SIR,—

Four specimens of *Papilio cresphontes* were captured in Fairfield Co., Conn., last summer, about the 25th of July. Others were seen

GEO. W. PECK.

New York, March 10th, 1878.

